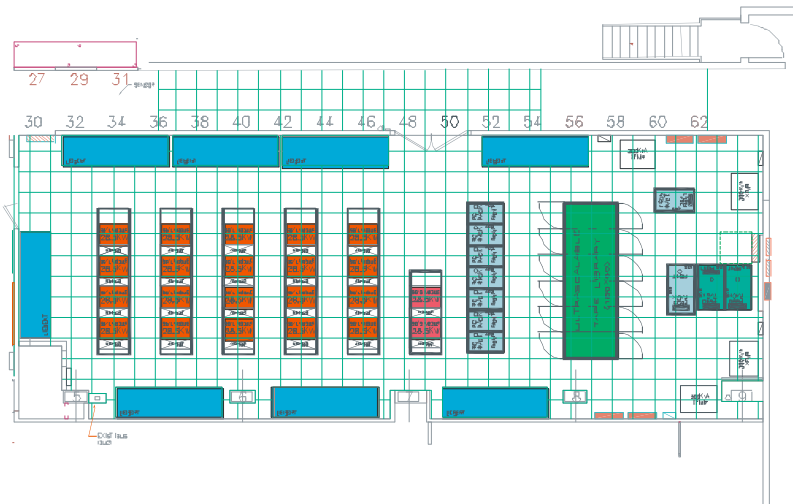# The INCITE Program:

Working Together on

Blue Gene Watson (BGW)

Fred Mintzer

Program Director, Blue Gene Watson

IBM TJ Watson Research Center

March 2, 2006

1

The INCITE Program: Working Together on Blue Gene Watson

- **IBM's Blue Gene Watson, a.k.a. "BGW"**

  - the world's most powerful private-sector supercomputer
  - 112 tf peak; 91.29 tf on LINPACK
  - A 20-rack BG/L supercomputer
    - 1K nodes per rack
    - five rows of four racks each
  - 100 tB of disk space
  - at IBM's T.J. Watson Research Center, Yorktown Heights, NY

The INCITE Program: Working Together on Blue Gene Watson

- ***The BGW Mission Statement***

- In the 1999 announcement, Blue Gene was intended to solely work on protein folding problems, for internal users, but its mission evolved

  Blue Gene Watson (BGW) was created to tackle the protein folding challenge; addressing that challenge is its top priority

  BGW is a unique resource; BGW will also address other grand-challenge scientific problems that require its unique capabilities

  BGW will also address challenging technical problems that explore or demonstrate the advantages of highly scalable architectures and projects that support Blue Gene business opportunities

The INCITE Program: Working Together on Blue Gene Watson

Roles of BGW Program Director

- With the BGW Policy Review Board, develop a program for the utilization of Blue Gene Watson
  - chair the BGW Policy Review Board (PRB)
  - see that needed policy is developed

- Manage that program (operational responsibility)
  - implement policy developed by the BGW PRB
    - prepare a weekly production schedule
  - make operational decisions, as needed

- Represent that program to others

The INCITE Program: Working Together on Blue Gene Watson

- *More about BGW*

  - Communications
    - 16 I/O nodes per rack
    - 1 gb link to the outside world (shared)
    - a firewall protects it from external attacks
      - a staging server is used to bring in data from external sources

  - Storage
    - 100 tB of disk
    - 300 tB of tape for internal users
    - means for bulk-data transfer to be added

The INCITE Program: Working Together on Blue Gene Watson

- *More about BGW*

  - Internal connections
    - not all partitions can be booted
    - allowable partitions are described in block files

  - The front-end nodes are all IBM p-655 servers running
    - SLES 9 Linux
    - the most current driver (V1R2M1) and compilers

  - BGW entered production in July 2005, but is still evolving
    - GPFS
    - Deep Computing Visualization (DCV) system installed
    - LoadLeveler

The INCITE Program: Working Together on Blue Gene Watson

- *More about BGW*

  - BGW is run as a production facility
    - maintains a full production schedule that runs 24/7; it never sleeps
    - although it is only supported during normal business hours
    - runs product-level operational code, almost always, as a matter of policy
    - a weekly production schedule is circulated to the users

BGW Production Schedule
week of 6 February 2006

BGW rows 0-1

	Mon	Tue	Wed	Thu	Fri	Sat	Sun
Midnight – 8 AM	E	E	E	P	P	E	E
8 AM – 4 PM	E	M	P	P	P	E	E
4 PM - midnight	E	E	P	P	E	E	E

BGW rows 2-3

	Mon	Tue	Wed	Thu	Fri	Sat	Sun
Midnight – 8 AM	S	P	P	P	S	S	S
8 AM – 4 PM	S/X	M	P	S	S	S	S
4 PM - midnight	P	P	P	S	S	S	S

BGW row 4

	Mon	Tue	Wed	Thu	Fri	Sat	Sun
Midnight - 8 AM	C	C	P	C	C	C	C
8 AM – noon	NP22	M	NP22	NP22	NP22	C	C
noon – 4 PM	NP22	NP22	NP22	NP22	NP22	C	C
4 PM – midnight	C	NP22	C	C	C	C	C

The INCITE Program: Working Together on Blue Gene Watson

- *Working together*

  - Some issues we'll need to work through:
    - How to provide BGW access? Can we establish remote access?
    - How to move large quantities of data into/out of the facility?
    - Who supports you for what activities? My support staff generally provide operational (vs. programming) support
    - How to schedule your time on BGW?
    - Are there any special needs?

    - And the answers may change as BGW evolves …

The INCITE Program: Working Together on Blue Gene Watson

- *Working together*

  - The Watson support staff includes:
    - Fred Mintzer
      - Program Director, BGW
      - mintzer@us.ibm.com
      - (914) 945-1478
    - Dave Singer
      - BGSF Operations Technical Team Lead/I
      - dmsinger@us.ibm.com
      - (914) 945-2314
    - Nathamuni Ramanujam (a.k.a. Ram)
      - IT Delivery, Server Operations IT Speciali
      - ramn@us.ibm.com
      - (914) 945-2203

The INCITE Program: Working Together on Blue Gene Watson

- **Working together**

  - To get started, I need to know

    - Institution
      - name
      - address
    - Contact
      - name
      - title
      - e-mail
      - phone
      - fax

- **"Life is an adventure. Enjoy the ride"**